

Childhood Trauma and Women's Health Outcomes in a California Prison Population

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A considerable amount of research over the past decade has focused on assessing the treatment needs of drug-dependent women offenders compared with their male counterparts. One key finding from this research is that incarcerated women are more likely to report extensive histories of emotional, physical, and sexual abuse—between 77% and 90%.^{1–7} Prevalence rates of childhood abuse among incarcerated women also are elevated when compared with women in the general population.^{2,8–12} The trauma that results from such abuse is a key contributor to adolescent conduct problems, subsequent delinquency, substance abuse, and criminality among women.

Furthermore, surveys conducted among incarcerated women have consistently shown a strong link between childhood abuse and adult mental health problems, particularly depression, posttraumatic stress, panic, and eating disorders. The costs of failing to diagnose and treat psychiatric disorders among offenders are high and can include unemployment, homelessness, and loss of custody of children.^{13–16}

Research also has shown that drug-dependent female offenders are more likely than male counterparts to suffer from chronic physical health problems, including tuberculosis (TB), hepatitis, toxemia, anemia, hypertension, diabetes, and obesity. Furthermore, female offenders have reproductive health needs, including those related to gynecological problems and prenatal and postpartum care. Women are also at greater risk than men of entering prison with sexually transmitted diseases (STDs) and HIV/AIDS because of their greater participation in prostitution.

Incarcerated women's health problems are compounded by the limited health care that they received before incarceration. Previous literature on incarcerated women has consistently shown that female offenders have very poor health services utilization in the community and that, while incarcerated, women seek medical services to a greater

extent than men.^{7,10,17–19} Women offenders are typically impoverished, with inadequate transportation and resources, limiting their access to community-based health systems. Moreover, access to adequate health care while incarcerated is often limited because of the costs of providing these services, as well as the relative invisibility of the health needs of female inmates.^{20,21}

The association of childhood abuse, substance abuse, comorbidity, and crime among female offenders has led many researchers to propose comprehensive treatment interventions that address these issues; however, the cumulative toll on women's physical health is often excluded as a focal point of these interventions. Few efforts have provided explanatory models that outline factors that contribute to the disproportionate prevalence of mental and physical health problems among female offenders. Assessing potential predictors of the mental and physical health problems among drug-dependent female offenders can greatly inform criminal justice policy, especially within a correctional system whose responsibility it is to house and treat them.

Our study built upon a series of reports from the Adverse Childhood Experiences

Objectives. We sought to describe the prevalence of childhood traumatic events among incarcerated women in substance abuse treatment and to assess the relation between cumulative childhood traumatic events and adult physical and mental health problems.

Methods. The study was modeled after the Adverse Childhood Events study's findings. In-depth baseline interview data for 500 women participating in the Female Offender Treatment and Employment Program evaluation were analyzed.

Results. Hypotheses were supported, and regression results showed that the impact of childhood traumatic events on health outcomes is strong and cumulative (greater exposure to childhood traumatic events increased the likelihood of 12 of 18 health-related outcomes, ranging from a 15% increase in the odds of reporting fair/poor health to a 40% increase in the odds of mental health treatment in adulthood).

Conclusions. Our findings suggest a need for early prevention and intervention, and appropriate trauma treatment, within correctional treatment settings. (*Am J Public Health.* 2006;96:1842–1848. doi:10.2105/AJPH.2005.082016)

(ACE) study, which demonstrates a link between childhood trauma and physical health problems. The ACE study found a strong relation between the cumulative number of events of childhood abuse and household dysfunction and multiple risk factors for the leading causes of death in adults, including chronic drug dependency and histories of attempted suicide and depression.

ACE studies were conducted with individuals sampled from a large health maintenance organization (HMO) in a metropolitan area. Hence, the sample comprised individuals who were more socially integrated than are individuals in the criminal justice system. There is a strong likelihood that the link between childhood trauma and adult physical and mental health problems is substantially more pronounced among a female offender population, owing to their elevated histories of childhood trauma, substance abuse, and HIV risk behaviors, as well as the barriers they face in accessing health services. Yet this relation has not been empirically tested with this population.

Following the analytic model described in the ACE studies, we described the prevalence of multiple types of childhood traumatic events among women in prison-based treatment.

Because the ACE study findings indicated that these events rarely occur in isolation and are highly correlated, we were interested in examining the cumulative number of different types of childhood traumatic events as related to a variety of adult physical and mental health problems and behaviors.

On the basis of previous findings on female offenders and from the ACE studies, we formulated 2 hypotheses: (1) greater exposure to childhood traumatic events among drug-dependent female offenders would be associated with greater histories of problem behaviors in adolescence and adulthood (e.g., conduct disorder, teen childbirth, homelessness, previous substance abuse treatment, involvement with children's protective services, and earlier criminal and drug-using behaviors), and (2) greater exposure to childhood traumatic events, combined with the preexisting substance abuse and criminal histories among this sample, would increase the likelihood of adult mental and physical health problems.

METHODS

Study Design

We report on an analysis of baseline data from the Female Offender Treatment and Employment Program (FOTEP) evaluation. The goal of the FOTEP project is to enable the successful reintegration of female parolees into the community. The FOTEP evaluation included a convenience sample of 500 women eligible for FOTEP participation on parole from 5 California prisons. Less than 5% of the women approached declined to be interviewed for the study. The baseline interviews were conducted in prison before release or in the community after release.

Eligibility and Participants

Inclusion criteria for FOTEP treatment included having participated in an in-prison substance abuse treatment program in California, paroling to a participating region where there was a FOTEP program, and having parental rights to at least 1 minor child. Within the state of California, men and women with a documented history of substance abuse or drug-related crimes are mandated into the prison-based substance abuse programs for 6–24 months at the end of

their sentence. Exclusion criteria included women who had enrolled in alternative post-parole drug treatment.

The sample was 40% African American, 18% Latino, 29% White, and 13% "other." About 47% had less than a high-school education, 18% had a general equivalency diploma, 10% were high-school graduates, 17% had attended college, and 8% had attended trade technical school. The women ranged in age from 21 to 57 years; the mean age was 35.1 years ($SD=6.1$). A total of 55% had never been married, 13% were married, and 32% were widowed, separated, or divorced. The participants had an average of 3.3 children ($SD=1.8$).

Approximately 60% were unemployed 12 months before incarceration, and approximately 50% received income from public assistance. The women reported about 3 times as much income from illegal means (e.g., prostitution, shoplifting, drug dealing) as from legal sources. Average age of first criminal behavior was 12 years, and average age at first arrest was 19 years, with an average of 17 previous arrests. The most frequently used drugs 12 months before incarceration were cocaine/crack, amphetamines, marijuana, and opiates.

A total of 43% reported a county clinic as their usual source of health care, 18% reported having a private physician, 18% reported a hospital or emergency room, 15% reported an HMO, and 6% reported having "nowhere to go" for health care.

Measures

Childhood traumatic events. Indicators of childhood traumatic events were based on self-reports of events before the age of 16 years in response to items from the Life Stressor Checklist–Revised (LSC-R).^{22–24} The LSC-R is designed to screen for the occurrence of 30 life events that meet the definition of "trauma" according to the *DSM-IV*.²⁵ It has demonstrated good criterion-related validity for posttraumatic stress disorder in diverse populations of women and has been found to be an appropriate measure among those with co-occurring substance abuse and mental health disorders.

Emotional abuse or neglect was defined as being "emotionally abused or neglected (e.g., being frequently shamed, embarrassed,

ignored, or repeatedly told that you were no good)." **Physical neglect** was defined as "being physically neglected (e.g., not fed, not properly clothed, or left to take care of yourself when you were too young or ill)." **Physical abuse** was defined as being "abused or physically attacked (not sexually) by someone you knew (e.g., a parent, boyfriend, or husband) who hit, slapped, choked, burned, or beat you up." **Sexual abuse** encompassed being "touched or made to touch someone else in a sexual way because he/she forced you in some way or threatened to harm you if you didn't" or "forced sex (oral, anal, genital) when you didn't want to because someone forced you in some way or threatened to harm you if you didn't."

Household dysfunction consisted of several possible components. **Family violence** was assessed by asking, "Did you ever see violence between family members (e.g., hitting, kicking, slapping, punching)?" **Parental separation/divorce** was assessed by asking, "Did your parents ever separate or divorce while you were living with them?" **Incarcerated family member** was defined as "a close family member being sent to jail/prison." **Out-of-home placement** was defined as "being in foster care or put up for adoption."

Dependent variables. Dependent variables included 18 self-reported health problems or health-related behaviors. Respondents were asked if they had "Ever been told by a health professional that [they] had any of the following health problems." Other questions were in regard to health-related behaviors (e.g., smoking, eating problems, injection drug use, prostitution), treatment received for mental health problems, and self-perceived general health and functioning. In addition, 2 standardized assessments were used to assess traumatic and psychological distress: the Trauma Symptom Checklist–40 (TSC-40) and the Brief Symptom Inventory (BSI) Global Severity Index (GSI), respectively. The TSC-40 is a 40-item self-report instrument consisting of 6 subscales, as well as a total traumatic distress score.²⁶ Each symptom item is rated according to its frequency of occurrence over the previous 2 months, using a 4-point scale ranging from "0=Never" to "3=Often." Any score equal to or greater than the median traumatic distress score was used as the cut-off for a positive indicator of overall traumatic distress. The BSI is

a 53-item questionnaire derived from the Symptom Checklist-90 that assesses 9 medical and psychological symptom dimensions. The scores on these separate dimensions (ranging from “0=Not at all” to “4=Extremely”) are combined to form a GSI. The raw scores from the GSI can then be transformed into *T* values (table values corresponding to raw scores derived from a Lykert-type scale) to determine a positive case. The standard cut-off for positive symptomology for a noninpatient female population is a *T* value greater than or equal to 63.

Analysis

Descriptive analyses (frequencies) and bivariate analyses (χ^2 and *t* test) were conducted to assess the prevalence and range of exposure to childhood traumatic events by demographic variables and behavioral variables including conduct disorder, teen childbirth, homelessness, previous drug treatment, and loss of custody of children. Self-reported criminal history variables also were explored by range of childhood traumatic events (*t* tests, analyses of variance [repeated-measures ANOVA]). Bivariate analyses were further conducted (χ^2) to assess the association between the number of childhood traumatic events and adult physical and mental health outcomes. Bivariate analyses were considered statistically significant with an effect size of $P < .05$.

A total of 18 logistic regression analyses were then conducted to assess whether exposure to a range of childhood traumatic events was significantly related to adult physical and mental health problems, controlling for other factors. Each model contained 3 covariates (age, race/ethnicity, and marital status) and a continuous variable for the total number of categories of childhood traumatic events endorsed (0–7). Although we ran many regression models, they do not intrinsically constitute a single “family” of post hoc comparisons, for which adjustment of α levels are recommended. We tested multiple independent models. However, as an overall strategy to correct for multiple comparisons, we adopted a conservative α level of .01 for the multivariate analyses.²⁷ Adjusted odds ratios and 95% confidence intervals are reported; significant effect size was set at the $P < .01$ level: $(\text{Exp}[\beta] - 1) \times 100 = \text{adjusted odds ratio}$ (e.g., the percent increase or decrease in the odds

TABLE 1—Prevalence of Childhood Traumatic Events Among FOTEP Women and Among Women in the HMO ACE Study

	HMO Women ^a (n = 4665), % (No. in ACE Study)	FOTEP Women (n = 491), % (No. in FOTEP Study)
Events involving abuse and neglect		
Emotional abuse and neglect	12.2 (569)	34.2 (167)
Physical neglect	9.2 (429)	14.5 (71)
Physical abuse	25.1 (1171)	30.6 (150)
Sexual abuse	24.3 (1134)	45.1 (220)
Events involving household dysfunction		
Family violence	13.9 (648)	47.6 (233)
Parental separation/divorce	25.4 (1185)	43.7 (215)
Incarcerated family member	6.9 (322)	33.8 (167)
Out-of-home placement	NA	19.9 (98)
No. of childhood traumatic events		
0	31.3 (1445)	15.7 (77)
1	24.2 (1119)	16.7 (82)
2	14.8 (700)	21.8 (107)
3	10.4 (467)	14 (69)
4	6.8 (327)	10.6 (52)
≥ 5	12.5 (606)	21.2 (104) ^a

Note. HMO = health maintenance organization; ACE = Adverse Childhood Experiences; FOTEP = Female Offender Treatment and Employment Program. Numbers from the ACE study are provided as an indication of the rates of childhood trauma or household dysfunction that one might expect to find in a nonprison population of women. Childhood events described in the ACE study varied slightly from those described here.

^aOf women in the FOTEP, 8.1% reported 5 childhood traumatic events, 7.7% reported 6, and 5.4% reported 7.

of a health problem). All 18 dependent variables were dummy coded (0=no and 1=yes).

RESULTS

Table 1 shows the frequencies of the 8 types of childhood traumatic events, ranging from 14.5% of the women reporting physical neglect to 47.6% reporting witnessing family violence. The prevalence of exposure to childhood traumatic events ranged from 0 to 7; 15.7% of the FOTEP women reported no childhood traumatic events, whereas more than 20% reported 5 or more, with 7 being the maximum reported. The frequencies of reported health problems ranged from 11% of the women reporting that they were told by a health professional that they had heart trouble to 83.8% reporting that they were currently smokers. Health problems or health-related behaviors reported by more than 50% of the women included physical inactivity (64%), prostitution (52%), traumatic distress (50%), and gynecological problems (52%).

Bivariate Comparisons

Table 2 displays the background characteristics before incarceration by cumulative exposure to childhood traumatic events. Findings partially supported our first hypothesis. There were significant increases in the proportion of women who had adolescent conduct disorder, histories of homelessness, and previous substance abuse treatment with greater exposure to childhood traumatic events. Between 62% and 76% of the women with 5 or more childhood traumatic events reported these histories, compared with 30% to 52% of those with no childhood traumatic events. Teen childbirth and loss of custody of children were not related to childhood traumatic events.

In further support of our first hypothesis, women with 5 or more childhood traumatic events reported the earliest involvement in drugs and crime (e.g., age of first arrest, age of first drug-related crime, property crime, violent crime, and sex-related crime) and had the largest mean number of previous arrests.

TABLE 2—Background Characteristics (%), by Number of Childhood Traumatic Events (n = 491)

	No. of Childhood Traumatic Events ^a						Total (n = 491)
	0 (n = 77)	1 (n = 82)	2 (n = 107)	3 (n = 69)	4 (n = 52)	≥5 (n = 104)	
Race/ethnicity, no.							
African American	53	40	41	44	39	26	40
Latina	18	18	17	12	21	23	18
White	23	28	30	32	27	33	29
Other	5	13	12	13	14	18	13
Marital status, no.							
Never married	57	57	54	50	62	55	55
Married/living as	10	12	17	15	6	13	13
Divorced/separated/widowed	33	31	29	35	33	33	32
Education, no.**							
Less than high school	42	57	51	35	59	41	47
High school graduate	9	12	10	15	8	7	10
General equivalency diploma	12	10	17	22	18	26	18
College	21	17	14	23	6	17	17
Trade school	16	4	8	6	10	10	9
Mean age, y**	37.1	34.8	35.7	34.5	34.7	33.7	35.1
Adolescent conduct disorder***	30	33	46	49	69	71	49
< 18 y of age when first child born	29	27	29	30	37	38	31
Lost parental rights to child or children	28	34	26	35	43	37	33
Ever homeless**	47	38	40	40	55	62	47
Ever receive drug treatment prior to prison treatment*	52	59	61	74	64	76	64
Mean age at first arrest, y***	22	19.2	20.3	18.9	18.1	16.5	19.2
Mean no. of times ever arrested***	12.8	18.5	15.1	13.3	16.7	22.9	16.8
Mean age first regular drug use, y***	23.8	21.3	21.9	20.3	18.8	19.1	20.9
Mean age first drug-related crime, y***	23.5	21.8	21.3	19.4	20.6	18.4	20.6
Mean age first property crime, y***	21.1	19.9	18.2	17.3	17	14.8	17.9
Mean age first violent crime, y*** ^b	25	22.1	20.8	19.7	19.5	17.6	20.2
Mean age first provided sex for money/drugs, y*** ^b	26.7	24.1	23.6	21.3	21.2	20	22.6

Note. Numbers vary slightly owing to missing data.

^aThe number of childhood traumatic events was the sum total of each of the 8 possible events, with 7 maximum.

^bOnly for the limited number of participants who engaged in prostitution or violent crimes (n = 265 and n = 279).

*P ≤ .05; **P ≤ .01; ***P ≤ .001.

For example, women with 5 or more childhood traumatic events were between 15 and 20 years of age when they engaged in the these criminal behaviors, compared with those who reported no childhood traumatic events who were between 21 and 27 years of age, respectively.

Table 3 shows the bivariate comparisons of health outcomes by exposure to childhood traumatic events. Within the category of behavioral health, there were generally increases in the proportion of women who had

engaged in prostitution or who had eating disorders with greater exposure to childhood traumatic events. For example, 41% of women who reported no childhood traumatic events had engaged in prostitution, compared with 69% of those who had experienced 4 events and 57% of those who had experienced 5 or more events. Similarly, 31% of the women who reported no childhood traumatic events reported having eating-related problems, compared with 53% of those who reported 5 or more childhood traumatic

events. There were no differences among the groups in number of childhood traumatic events for smoking.

Within the category of mental health, there were increases in the proportion of women reporting use of psychotropics, previous mental health treatment, or previous suicide attempts, associated with greater exposure to childhood traumatic events. For example, 26% of the women with no childhood traumatic events reported use of psychotropic medications compared with 55% of those with 5 or more events. A total of 17% of those reporting no childhood traumatic events had previously received mental health treatment compared with 51% of those reporting 5 or more childhood traumatic events; similarly, 17% of those with no childhood traumatic events had previously attempted suicide, compared with 49% of those reporting 5 or more childhood traumatic events. In addition, there were also generally increases in the proportion of women who had a positive GSI score or a positive TSC score with greater exposure to childhood traumatic events.

With regard to infectious diseases, there were increases in the proportion of women who had hepatitis and who had STDs with greater exposure to childhood traumatic events: 13% of the women who reported no childhood traumatic events had hepatitis, compared with 39% of the women who reported 4 childhood traumatic events and 31% of the women who reported 5 or more childhood traumatic events. Additionally, 16% of the women who reported no childhood traumatic events had STDs, compared with 37% of those who reported 5 or more childhood traumatic events. TB was not associated with childhood traumatic events.

With regard to substance abuse, the previous pattern was repeated for those disclosing that they had alcohol problems. For example, 21% of the women reporting no childhood traumatic events reported having alcohol problems, compared with 44% of the women who had greater than 5 childhood traumatic events. Being an intravenous drug user was not related to childhood traumatic events.

Within the category of medical problems, the proportion of women with gynecological problems increased with greater exposure to

TABLE 3—Rates of Adverse Health Outcomes, by Number of Childhood Traumatic Events (n=491)^a

	No. of Childhood Traumatic Events ^a						Total (n=491), % (n)
	0 (n=77), % (n)	1 (n=82), % (n)	2 (n=107), % (n)	3 (n=69), % (n)	4 (n=52), % (n)	≥5 (n=104), % (n)	
Behavioral health							
Current smoker	90 (68)	82 (67)	85 (90)	77 (51)	86 (44)	84 (86)	84 (406)
Prostitution*	41 (31)	50 (41)	51 (54)	49 (34)	69 (36)	57 (59)	52 (255)
Eating problems*	31 (24)	40 (33)	34 (36)	39 (27)	52 (27)	53 (55)	41 (202)
Mental health							
Psychiatric medication***	26 (20)	29 (24)	36 (38)	44 (30)	43 (22)	55 (57)	39 (191)
Mental health treatment***	17 (13)	22 (18)	24 (26)	26 (18)	48 (25)	51 (53)	31 (153)
Suicide***	17 (13)	16 (13)	24 (26)	23 (16)	37 (19)	49 (51)	28 (138)
GSI (≥63)***	15 (11)	16 (13)	25 (26)	23 (16)	32 (16)	45 (46)	27 (128)
Traumatic distress (≥23)***	35 (26)	41 (33)	45 (48)	55 (38)	67 (35)	65 (67)	51 (247)
Infectious diseases							
Hepatitis*	13 (10)	27 (22)	30 (32)	33 (23)	39 (20)	31 (32)	28 (139)
STD*	16 (12)	23 (19)	24 (26)	25 (17)	37 (19)	37 (38)	27 (131)
TB	9 (7)	10 (8)	16 (17)	17 (12)	21 (11)	15 (15)	14 (70)
Substance abuse							
Alcoholic*	21 (16)	31 (25)	32 (34)	38 (26)	31 (16)	44 (46)	33 (163)
IDU	18 (14)	23 (19)	27 (29)	27 (18)	27 (14)	31 (32)	26 (126)
Medical problems							
Gynecological**	42 (32)	39 (32)	56 (60)	49 (34)	67 (35)	58 (60)	52 (253)
High blood pressure	16 (12)	6 (5)	16 (17)	9 (6)	15 (8)	13 (13)	12 (61)
Heart	9 (7)	10 (8)	11 (12)	9 (6)	15 (8)	13 (13)	11 (54)
Ulcers	10 (8)	11 (9)	15 (16)	9 (6)	19 (10)	20 (21)	14 (70)
Fair/poor self-reported health status	26 (20)	29 (23)	34 (36)	29 (20)	42 (21)	39 (41)	33 (161)

Note. GSI = Global Severity Index; STD = sexually transmitted disease; TB = tuberculosis; IDU = intravenous drug use. Numbers vary slightly owing to missing cases.

^aNumber of categories of events was the sum total of each of the 8 possible events, with 7 being the maximum.

* $P \leq .05$, ** $P \leq .01$, *** $P \leq .001$.

Childhood traumatic events were not related to smoking.

Mental health. Childhood traumatic events were significantly and positively related to the 5 mental health variables. For an increase of 1 childhood traumatic event, the odds of women taking psychotropic medication were increased by 27% ($P < .001$), of having received mental health treatment by 40% ($P < .001$), of having a positive GSI score by 35% ($P < .001$), and of having a positive TSC score by 27% ($P < .001$). Thus, the magnitude of the largest possible effect found is such that, for a woman who reported experiencing 7 childhood traumatic events, her odds of having received mental health treatment as an adult would be increased by 980%.

Infectious diseases. Childhood traumatic events were significantly and positively related to STDs. For an increase of 1 childhood traumatic event, the odds of having an STD were increased by 23% ($P < .001$). Using the conservative P value of .01, childhood traumatic events were not related to hepatitis ($P < .03$) or TB ($P < .06$).

Substance abuse. Childhood traumatic events were significantly and positively related to having an alcohol problem. For an increase of 1 childhood traumatic event, the odds of having an alcohol problem were increased by 21% ($P < .001$). Childhood traumatic events were not related to injection drug use.

Medical problems. Childhood traumatic events were significantly and positively related to gynecological problems. For an increase of 1 childhood traumatic event, the odds of having gynecological problems were increased by 15% ($P < .004$). Childhood traumatic events were not related to ulcers, high blood pressure, or heart problems, although the relation for ulcers approached significance at $P < .05$.

Self-rated health status. For an increase of 1 childhood traumatic event, the odds of reporting fair/poor health as an adult were increased by 15% ($P < .003$).

DISCUSSION

Following the analytic model from the ACE studies, we assessed the cumulative exposure to childhood traumatic events and

childhood traumatic events: 42% of the women who reported no childhood traumatic events reported gynecological problems, compared with 67% of those who reported 4 childhood traumatic events and 58% of those who reported 5 or more childhood traumatic events. High blood pressure, heart trouble, or ulcers were not related to childhood traumatic events (reported by less than 15% of the sample). Self-rated health status was not related to the number of childhood traumatic events.

Logistic Regressions

Table 4 summarizes the results of the 18 logistic regression models (using a conservative P value of .01). Results for the total number of

childhood traumatic events (0–7) variable are shown for each dependent variable and provide support for our second hypothesis.

Behavioral health. The number of childhood traumatic events was significantly and positively related to engaging in prostitution and having an eating-related problem. For an increase of 1 childhood traumatic event, the odds of women engaging in prostitution as an adult were increased by 19% ($P < .001$) and the odds of having an eating-related problem as an adult also were increased by 19% ($P < .001$). In other words, if a woman reported a total of 7 types of childhood traumatic events, the odds of her engaging in adult prostitution would be increased by 230% compared with a woman who had no childhood trauma.

TABLE 4—Number of Childhood Traumatic Events by Adverse Health Outcomes

	No. of Childhood Traumatic Events (0–7)		
	n	P	Exp(β) ^a (95% Confidence Interval)
Model 1: Current smoker	482	.354	0.95 (0.84, 1.07)
Model 2: Prostitution ^b	487	.001	1.19 (1.08, 1.31)
Model 3: Eating problems ^c	489	.001	1.18 (1.08, 1.30)
Model 4: Psychiatric medication ^c	487	.001	1.27 (1.16, 1.40)
Model 5: Mental health treatment	489	.001	1.4 (1.26, 1.55)
Model 6: Suicide	488	.001	1.35 (1.22, 1.50)
Model 7: GSI (> 63)	479	.001	1.34 (1.20, 1.48)
Model 8: Traumatic distress	484	.001	1.27 (1.15, 1.39)
Model 9: Hepatitis ^{b,c,d}	489	.026	1.13 (1.01, 1.25)
Model 10: STD ^b	489	.001	1.23 (1.10, 1.36)
Model 11: TB ^b	488	.056	1.13 (0.99, 1.28)
Model 12: Alcohol-related problems ^b	488	.001	1.21 (1.10, 1.33)
Model 13: IDU ^{c,d}	487	.183	1.08 (0.97, 1.20)
Model 14: Gynecological problems ^b	489	.004	1.15 (1.05, 1.26)
Model 15: High blood pressure ^{b,c,d}	489	.176	1.1 (0.96, 1.27)
Model 16: Heart problems ^d	489	.176	1.1 (0.96, 1.27)
Model 17: Ulcers	489	.046	1.14 (1.00, 1.29)
Model 18: Fair/poor health	482	.003	1.15 (1.05, 1.27)

Note. GSI = Global Severity Index; STD = sexually transmitted disease; TB = tuberculosis; IDU = intravenous drug use. Number of childhood traumatic events was entered as a continuous variable with 7 events being the highest possible number in all regressions models ($df = 1$). All models were controlled for age, race/ethnicity, and marital status.

^aThis value represents the odds of being in the “yes” category relating to the dependent variables. The adjusted odds ratio formula ($\text{Exp}[\beta] - 1$) \times 100 produces the amount of 1 unit of change in the odds (i.e., an increase or decrease of 1 childhood traumatic event on a scale of (0, 7). If the value is greater than 1, the odds are increased; if the value is less than 1, the odds are decreased.

^bRace/ethnicity was significantly related to Models 2, 9, 10, 11, 12, 13, 14, and 15.

^cMarital status was significantly related to Models 3, 4, 9, and 15.

^dAge was significantly and positively related to Models 9, 13, 15, and 16.

health outcomes within a sample of drug-dependent female offenders. As expected, this sample of drug-dependent female offenders had considerably greater overall exposure to childhood adverse events compared with the HMO sample of women from the ACE studies. In fact, the FOTEP women were substantially more likely to have reported each childhood traumatic event occurring at least once before 16 years of age, compared with the HMO sample of women reporting the same or similar events occurring before 18 years of age.

We hypothesized and confirmed that greater exposure to childhood adverse events was associated with behavioral problems in adolescence and adulthood. Moreover, there was a strong relation between the onset of criminal events and exposure to childhood traumatic events, with younger age of onset

associated with greater exposure. These findings mirror national studies documenting the characteristics of girls in juvenile correctional settings and substantiate the role that physical and sexual abuse has played in their delinquency.

We also found a strong and graded relation between the amount of exposure to childhood abuse and household dysfunction and adult physical and mental health problems. Childhood traumatic events were significantly and positively related to 12 of the 18 dependent variables examined. Effect sizes ranged from a 15% increase in odds of gynecological problems or poor health to a 40% increase in odds of mental health treatment, relative to an increase of 1 childhood traumatic event.

The largest effect of exposure to childhood trauma was for the 5 mental health outcomes assessed. The resulting magnitude of

the additive effects of exposure to multiple childhood traumatic events was alarming (e.g., a 980% increase in the odds of mental health treatment relative to exposure to 7 childhood traumatic events), especially in light of the fact that we measured only the impact of whether the childhood traumatic event occurred once before the age of 16 years and not the actual frequency of the events during that time period. This is a key finding with regard to the general lack of appropriate mental health treatment available to women in correctional treatment programs, as well to the risk of recidivism associated with co-occurring mental health and substance abuse disorders.

Study Limitations

First, our measures of childhood traumatic events and physical and mental health were based on self-report. Thus, we were not able to validate these responses with objective measures (e.g., medical or legal records). Second, although the LSC-R has previously demonstrated good criterion-related validity, it still relies on retrospective data collection, which can be confounded by many factors (e.g., underreporting owing to concerns of stigmatization or overreporting because of recent experiences of violence; also, recall may be influenced by current mental health status).²⁸ Third, given the barriers to accessing community health care among this population, many women may have undiagnosed health conditions or obtained diagnoses only upon accessing health care within prison. Thus, existing health problems that were included as dependent variables in the study may have been underestimated, along with their relation with childhood traumatic events. Lastly, the findings generated by this study are limited to inmates who were selected for prison-based treatment in California and, thus, may not be generalizable to general inmate female populations or other prison-based treatment populations.

Conclusions

The finding that physical and mental health problems among women offenders may have their origins in childhood events indicates the need for early prevention and intervention initiatives for girls (and, most likely, boys). Nurse home-visits for at-risk mothers and children

and adolescent treatment programs focused on trauma and abuse could help reduce the incidence of child abuse as well as the lifelong impact of such abuse. Early prevention and intervention programs also could help to alleviate the growing costs to society that are a result of the physical and mental health problems experienced by adult women offenders with such histories of trauma, as well as the subsequent effects on their children.

Consistent with the widely demonstrated association between exposure to life stressors and physical health problems,^{29–30} particularly among women with a history of trauma,³¹ the study findings suggest that drug-dependent women offenders with multiple childhood traumatic events are at high risk for associated physical health problems. Yet the nature of the disorders observed in relation to childhood traumatic events suggests that many such adverse health outcomes (e.g., addiction, gynecological problems, eating problems, suicidality, symptoms of traumatic distress) may be responsive to public health interventions and amenable to ongoing behavioral management. The long-term consequences of these untreated physical and mental health problems have implications for community health, as well as for promoting positive health behaviors that may help to reduce future recidivism. ■

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Contributors

N. Messina was responsible for the preparation of the manuscript, and C. Grella was responsible for guiding the design of the study, as well as review and commentary on the manuscript.

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Human Participant Protection

The University of California, Los Angeles South General Campus institutional review board reviewed and approved all procedures with human subjects for this study, and a Federal Certificate of Confidentiality was obtained.

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